

PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

PCT

To:

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Patent- und Rechtsanwaltsbüro

Eing. - 6. Juni 2006 | *Ky*

Frist

NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL PRELIMINARY
REPORT ON PATENTABILITY

(PCT Rule 71.1)

Date of mailing
(day/month/year)

06.06.2006

Applicant's or agent's file reference
85/TY00M91WO

IMPORTANT NOTIFICATION

International application No.
PCT/IB2005/000344

International filing date (day/month/year)
11.02.2005

Priority date (day/month/year)
13.02.2004

Applicant
TOYOTA JIDOSHA KABUSHIKI KAISHA et al.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary report on patentability and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. REMINDER

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary report on patentability. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

The applicant's attention is drawn to Article 33(5), which provides that the criteria of novelty, inventive step and industrial applicability described in Article 33(2) to (4) merely serve the purposes of international preliminary examination and that "any Contracting State may apply additional or different criteria for the purposes of deciding whether, in that State, the claimed inventions is patentable or not" (see also Article 27(5)). Such additional criteria may relate, for example, to exemptions from patentability, requirements for enabling disclosure, clarity and support for the claims.

Name and mailing address of the international
preliminary examining authority:



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PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

| | | | |
|---|--|--|----------------------|
| Applicant's or agent's file reference 85/TY00M91/WO | FOR FURTHER ACTION | | See Form PCT/PEA/416 |
| International application No. PCT/B2005/000344 | International filing date (day/month/year) 11.02.2005 | Priority date (day/month/year) 13.02.2004 | |
| International Patent Classification (IPC) or national classification and IPC INV. H02M3/156 F02N11/08 | | | |
| Applicant TOYOTA JIDOSHA KABUSHIKI KAISHA et al. | | | |
| <p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 6 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> sent to the applicant and to the International Bureau) a total of 10 sheets, as follows:</p> <p style="margin-left: 40px;"><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p style="margin-left: 40px;"><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p> | | | |
| <p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the report</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p> | | | |
| Date of submission of the demand 25.01.2006 | | Date of completion of this report 06.06.2006 | |
| Name and mailing address of the international preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016 | | Authorized officer Gentili, L Telephone No. +31 70 340-2872  | |

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/IB2005/000344

Box No. I Basis of the report

1. With regard to the **language**, this report is based on
- ☒ the international application in the language in which it was filed
 - ☐ a translation of the international application into , which is the language of a translation furnished for the purposes of:
 - ☐ international search (under Rules 12.3(a) and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4(a))
 - ☐ international preliminary examination (under Rules 55.2(a) and/or 55.3(a))
2. With regard to the **elements*** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

Description, Pages

| | |
|------------|--|
| 1, 2, 4-18 | as originally filed |
| 3, 3a-3c | received on 25.01.2006 with letter of 25.01.2006 |

Claims, Numbers

| | |
|------|--|
| 1-13 | received on 25.01.2006 with letter of 25.01.2006 |
|------|--|

Drawings, Sheets

| | |
|------------|---------------------|
| 1/11-11/11 | as originally filed |
|------------|---------------------|

- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 - ☐ any table(s) related to sequence listing (*specify*):
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 - ☐ any table(s) related to sequence listing (*specify*):

* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/IB2005/000344

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

| | | |
|-------------------------------|-------------|------|
| Novelty (N) | Yes: Claims | 1-13 |
| | No: Claims | |
| Inventive step (IS) | Yes: Claims | 1-13 |
| | No: Claims | |
| Industrial applicability (IA) | Yes: Claims | 1-13 |
| | No: Claims | |

2. Citations and explanations (Rule 70.7):

see separate sheet

Re Item V

**Reasoned statement with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement**

Reference is made to the following document:

D1: US-A-3 784 893 (RANDO R,US) 8 January 1974 (1974-01-08)

D2: EP-A-1 079 496 (TOYOTA JIDOSHA KABUSHIKI KAISHA) 28 February 2001
(2001-02-28)

Document D1 is regarded as being the closest prior art to the subject-matter of claim 1, and shows (the references in parentheses applying to this document) a voltage generator device (see fig.1) comprising:

a voltage generating portion (1121-133,108-110,115-117) that receives an input voltage (E_{IN}) and generates a target voltage (E_{OUT});

an observing portion (101,103,106,114) that observes an operating condition of the voltage generating portion ; and

a control portion (104,111-113,135,150,194,187,188) which causes the voltage generating portion to maintain a voltage generating operation even if the operating condition observed by the observing portion is within a first region that is apart from a normal region (column 9 lines 37-53; see also fig.2 operating curves "b" and "g", where operation is maintained at reduced output voltage when current is between 100% and 125% of rated output current), and which causes the voltage generating portion to stop the voltage generating operation if the operating condition observed is within a second region that is further apart from the normal region than the first region is (column 11 lines 30-50 and fig.2 operating curve "e": when current reaches 125% of rated output current operation is stopped).

The subject-matter of claim 1 differs from this known device in that:

the voltage generator device is capable to attain a voltage compensation by raising an output voltage when a battery voltage decreases at the time of restart of an engine after an idle stop, wherein, if an output current exceeds a first value of current, the output voltage is reduced, or, if the output voltage exceeds a first value of voltage, a switching operation of the voltage generating portion (11) is intermittently performed.

The subject-matter of claim 1 is therefore new (Article 33(2) PCT).

The problem to be solved by the present invention may be regarded as: preventing undervoltage or overcurrent load failures in an idle-stop type vehicle.

The solution to this problem proposed in claim 1 of the present application is considered as involving an inventive step (Article 33(3) PCT) for the following reasons:

D1 does not give any hint to operate the voltage generator device according to the solution proposed in the present patent application, and does not consider the case of sudden drops in input voltage (E_{IN}), so that D1 is not easily adaptable to vehicles with idle-stop operation. D2 teaches to suspend idle-stop operation in an idle-stop vehicle if an abnormal condition, such as a low battery voltage, is detected.

Thus, even combining the teachings of D1 and D2, the skilled person would not have any hint to solve the problem using the solution of claim 1, which therefore can be considered inventive.

Independent method claim 7 can be also considered new and inventive for the same reasons, mutatis mutandis, already given above for claim 1.

Claims 2-5, 8-11 and 13 are dependent on claim 1 or 7 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

Document D2 discloses a control method for a motor vehicle that includes a voltage generator device (34) that compensates for a change in an output voltage of an electricity storage means (generator 34 compensates for lower open-circuit voltage of the storage means 42 by increasing the adjustment voltage VC, see figures 3 and 4), comprising the steps of:

observing an operating condition (output voltage of generator 34, i.e. voltage VB at node 50) of the voltage generator device (34) and causing the voltage generator device (34) to maintain a voltage generating operation even if the operating condition is within a first region that is apart from a normal region (this first region corresponds to $VB < VD$, where the generator 34 is obviously maintained in operation to feed the electric loads, even if it cannot charge the battery 34);

controlling stopping and starting of an engine in accordance with a state of the motor vehicle if the operating condition is within the normal region; and

prohibiting an automatic stop of the engine if it is detected that the operating condition is within the first region (see paragraph [30]).

The subject matter of claim 12 differs from such known motor vehicle in that:
the voltage generator device attains a voltage compensation by raising an output voltage when a battery voltage decreases at the time of restart of an engine after an idle stop, wherein, if an output current exceeds a first value of current, the output voltage is reduced, or, if the output voltage exceeds a first value of voltage, a switching operation of the voltage generating portion (11) is intermittently performed.

The subject-matter of claim 12 is therefore new (Article 33(2) PCT).

The problem to be solved by the invention of claim 12 may be regarded as: preventing undervoltage or overcurrent load failures in an idle-stop type vehicle.

The solution given by the invention of claim 12 can be considered inventive for reasons which are similar to those already given for claim 1: the combination of the teachings of D2 and D1 does not lead to the proposed solution.

Independent device claim 6 corresponds to independent method claim 12 and thus can also be considered new and inventive.

Subject matter of claims 1-13 finds an industrial applicability in the field of electric boards for vehicles with idle-stop operation.